Appendix D: Development of Recommendations Memo

MEMORANDUM

To: Suzanne Engelke, City of Roseville

From: Mauricio Hernández, Alta Planning + Design

CC: Kaitlin Scott, Alta Planning + Design

Date: May 15, 2024

Re: Roseville Active Transportation Plan - Recommendation Development Approach and Data

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Introduction

This memo outlines the approach and methodology for developing recommendations for the City of Roseville Active Transportation Plan. This methodology relies on using consistent data and a clear process to apply federal, state, and city design guidance in an objective and context-sensitive manner. The outcome of this methodology will be a set of maps depicting existing, funded, and newly proposed projects, along with a project list with the project name, proposed facility type, segment endpoints, and segment length for each recommended improvement. The proposed improvements will prioritize developing a complete active transportation network to improve equity access to the network, the safety of all users, and connectivity.

Guidelines and Standards

Local, state, and federal guidelines and standards to follow for developing recommendations include:

- City of Roseville Design & Construction Standards (2023)
    - Informs design of public infrastructure, including standards for pedestrian facilities and bikeways
- City of Roseville Community Design Guidelines (2008)
    - Informs design of sidewalks, traffic calming, and midblock pedestrian crossings when street frontages are privately constructed in association with Commercial (CC), Office & Industrial (OI), Multi-family (MF) and Compact Residential (CR) projects
- Caltrans 7th Edition Highway Design Manual (HDM) – Chapter 1000 Bicycle Transportation Design (2015)
    - Informs the design and implementation of bicycle facilities. References FHWA Bikeway Selection Guide
- Caltrans Design Information Bulletin Number 94 – Complete Streets Contextual Design Guidance (2024)
    - Informs decision to maximize the use of the public right of way to achieve sustainable and equitable mobility
- Caltrans Design Information Bulletin Number 89-02 – Class IV Bikeway Guidance (2022)
    - Informs the design and implementation of Class IV bicycle facilities
- Caltrans Traffic Calming Guide (2023)
    - Informs design and implementation of different traffic calming treatments
- FHWA Bikeway Selection Guide (2019)
    - Informs facility type recommendation based on roadway speed, volume, and urban/rural context
- FHWA Small Town and Rural Multimodal Networks (2016)

  - Informs rural bicycle and pedestrian recommendations
- FHWA Safe Transportation for Every Pedestrian (STEP)
  - Informs pedestrian improvements
- FHWA STEP: Improving Visibility at Trail Crossings (2021)
  - Informs pedestrian and bicycle improvements at trail crossings
- FHWA Proven Safety Countermeasures
  - Supplements pedestrian and bicycle recommendations as needed based on location
- FHWA Road Diet Informational Guide
  - Informs road diet feasibility determination

Recommendations Development Rounds

Infrastructure recommendations will be developed in two main rounds. The first round will build directly on the Existing Conditions memo, using key data to build an initial "backbone" network of bicycle and pedestrian improvements. This will include a desktop review of existing sidewalks, marked crosswalks, and bikeways data to identify clear network gaps. Additionally, the first round will focus on streets and intersections with the highest collision rates, streets with transit routes and high-ridership bus stops, areas within ¼-mile of the city's schools, commercial corridors, and Pedestrian Districts as identified in the Circulation Element of the City's General Plan.

The second round will be focused on identifying additional improvements across the rest of the city, based on the bicycle and pedestrian considerations and criteria below. This round will also incorporate feedback received during public engagement activities, as appropriate, such as specific locations or infrastructure types requested using the online mapping tool. Community input will be evaluated by the project team to identify feasible, cost-effective solutions to community concerns and ideas.

Recommendations Development Approach

Bicycle Recommendations Considerations

Alta will identify context-sensitive bikeway recommendations using a multi-step approach that allows us to evaluate feasibility while meeting the needs of people bicycling in Roseville. Following the guidelines and standards described above, such as the FHWA Bikeway Selection Guide, Alta will use the following high-level process for determining proposed bicycle projects:

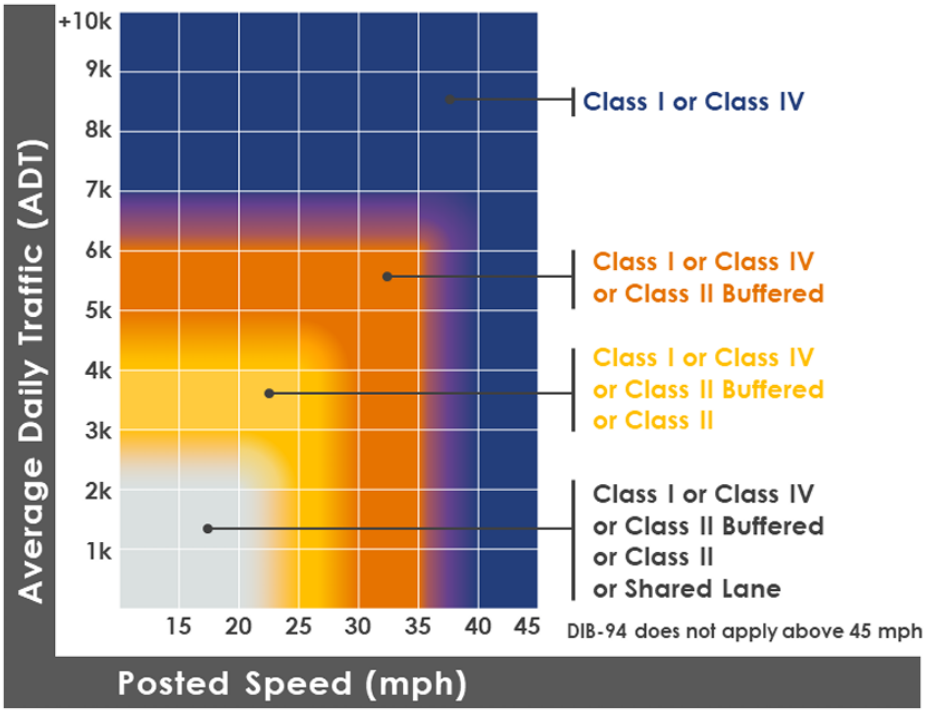
1. Identify **locations** for improvements (i.e., corridors and intersections)
2. Identify the desired bikeway class.
3. Evaluate the desired bikeway class for feasibility using various criteria (described below)
4. Recommend a preferred bikeway.
5. If necessary, explore feasible alternatives or the "next best" facility if the preferred bikeway is not feasible.

The three main criteria that Alta will use to evaluate bicycle network recommendations include:

Criterion 1. Roadway Context

First, Alta will consider what facility is most appropriate for different roadways based on their motor vehicle ***speeds***, using the City's radar-enforceable posted speed limits and *traffic volumes (AADT),* using ESRI Living Atlas or Replica average daily traffic data. Federal and state guidance indicates that, in general, the higher the speed and volume of a roadway, the more protective the recommended bikeway should be. Class III bicycle routes and boulevards are most appropriate for lower speeds and volumes, such as along local residential streets; Class II bike lanes or buffered bike lines are best for streets with low speeds and low to moderate volumes; and Class IV separated bike lanes, or Class I multi-use trails are best for moderate to high speeds and high volumes. The graphic below shows general guidance for how vehicle volumes and speeds may be considered to determine a preferred bikeway type.

Figure 1: Caltrans DIB-94 Bikeway Selection Chart



It is important to note that the suggested parameters in this graphic assume that actual speeds are close to posted speed limits. If, however, the City has specific data indicating that actual speeds are higher than posted speed limits (e.g., from consistent community input or police data), then Alta can consider the actual speed rather than the posted speed.

Criterion 2. Planned/Funded Projects

This criterion builds on planned/funded and already under-design projects the City has in the pipeline over the next five years. This information will help us:

- Avoid redundant or conflicting projects between the Active Transportation Plan recommendations and previous or concurrent efforts and
- Identify potential connections to planned/funded projects to avoid bicycle network gaps.

Criterion 3. Roadway Reconfiguration Feasibility Index & Usable Space

Based on ADT data from Criterion 1 and identified the need for greater accommodations for active transportation modes, Alta will also identify roadways that are candidates for roadway narrowing via lane width reduction ("lane diet"). Per the Caltrans Traffic Calming Guide, ADT provides a good first determination of whether to consider lane width reductions. According to FHWA, roadways with an ADT of 20,000 or less are good candidates for lane diets, wherein lane widths can be reduced to 10.5 or 11 feet, and excess asphalt can be striped with a bicycle lane. However, this can vary for different jurisdictions and can be further evaluated for feasibility using other considerations in the next section. We will work with City staff to determine the most appropriate thresholds for Roseville.

Other Considerations

In addition to the three primary criteria described above, Alta will consider other factors when determining bicycle recommendations, including but not limited to:

- Equity, community input, and neighborhood identity
- Collision hotspots
- Unique environment conditions like topography and landscape
- Physical constraints, including available right of way
- Barriers such as railroads and waterways
- Traffic vehicle mix (e.g., whether roadways have a lot of bus or freight/truck traffic)
- Frequency of driveways and intersections

Pedestrian Recommendation Considerations

Pedestrian facility uses and needs vary across contexts, and the application of pedestrian facilities should be sensitive to those variations. As such, recommendations for sidewalks and other pedestrian facilities will be developed using various criteria. When appropriate, the following high-level guidelines will be followed:

1. Sidewalks should be installed on *at least one side* of the roadway and both sides whenever feasible for all local public roads.
    a. There is at least one bus route, and high-ridership bus stops on the roadway within 1,000 feet of the missing sidewalk.
2. Roadways within ¼ -mile radius of elementary, middle, and high schools should have sidewalks on both sides of the street.

In addition to these high-level best practices, there are several other considerations for determining appropriate pedestrian treatments at different locations. The decision trees in Tables 1 and 2 outline potential treatments for different conditions on local (Table 1) and collector and arterial (Table 2) streets. These conditions include posted speed limits, roadway width, stop and signal control, the presence of transit stops, and more.

Table 1: *Decision Tree for Pedestrian Infrastructure Recommendations –* ***LOCAL STREETS only***

	Posted Speed Limit	Crossing Distance	Transit/Bus Stops	Stop-Control	On-Street Parking	Left Turn from Cross Street	Mid-Block Crossing (*Existing mid-block crossing OR long distance [>500 feet] between existing crossings*)
Condition	25 MPH or lower	2 lanes OR total distance less than 24 feet, no bike lanes	Yes	2-way stop	Yes	Yes	Yes, 2 lanes crossed
Treatments	-High-visibility crosswalk	-High-visibility crosswalk	-	-Evaluate warrants to convert to 4-way stop -Add crosswalk & RRFB or other LED flashing sign to non-controlled leg	-Curb extensions -Restrict parking 20 ft on intersection approaches to preserve sight triangles (per AB 413) -Daylight crosswalks in locations around schools, parks, or where the corner sight distance is severely restricted	-Consider leading pedestrian interval -Phase-separated left turn	-High-visibility crosswalk -Advanced yield markings/signage -Rectangular rapid flashing beacon (RRFB) or other LED flashing signs -Curb extensions -Enhanced lighting
Condition	Higher than 25 MPH	More than 2 lanes, or total distance greater than 30 feet	No	4-way stop	No	No	Yes, greater than 2 lanes crossed
Treatments	-High-visibility crosswalk	-High-visibility crosswalk -Curb extensions -LED flashing signs	-Curb extensions	-Evaluate warrants for signal control	N/A	N/A	-High-visibility crosswalk -RRFB or other LED flashing sign with advance yield markings -Signalized pedestrian crossing with stop bar -Curb extensions -Median refuge island

Table 2: *Decision Tree for Pedestrian Infrastructure Recommendations –* ***COLLECTOR and ARTERIAL STREETS ONLY***

	Number of Lanes to Cross at Intersection	Transit/Bus Stops	Stop-Control	On-Street Parking	Mid-Block Crossing (*Existing mid-block crossing OR long distance [>500 - 1000 feet] between existing crossings*)	Signalization	Right Turn Slip Lanes
Condition	2 or 3	Yes	2-way stop	Yes	Yes, 2 lanes crossed	Yes	Yes
Treatments	-Lane narrowing (see Caltrans DIB 94 for guidance) -High-visibility crosswalk		-Evaluate warrants to convert to 4-way stop	-Curb extensions -Restrict parking 50 ft on intersection approaches to preserve sight triangles -Daylight crosswalks in locations around schools, parks, or where the corner sight distance is severely restricted	-High-visibility crosswalk (Only at controlled crossings for arterials; collectors would need additional safety measures) -Advanced yield markings/signage - Rectangular Rapid Flashing Beacons (RRFBs) or other LED flashing sign -Curb extensions if they do not interfere with bike lanes -Median refuge island Enhanced lighting	-Consider leading pedestrian interval when a signal is not coordinated -Conduct warrant analysis for phase-separated left turn	-Raised crosswalk -Evaluate for elimination of slip lane
Condition	4 or more	No	4-way stop	No	Yes, greater than 2 lanes crossed	No	No
Treatments	-High-visibility crosswalk -Curb extensions (no bus stops) if no conflict with bike lanes or right-turn lanes -Median refuge islands -Lane narrowing	- Curb extensions if the posted speed limit is 30 MPH or less if there is no conflict with bike lanes or right turn lanes	-Evaluate warrants for signal control	N/A	-High-visibility crosswalk -Pedestrian signal with stop bar -Advanced yield markings -Curb extensions -Median refuge island	See Stop-Control	N/A

Class I Multi-Use Trail Considerations

In addition to bicycle and pedestrian recommendations, Alta will focus on Class I multi-use trail crossings and connections. Roseville has several Class I multi-use trails and Alta will identify connectivity issues in the trail network and then recommend improvements to fill in those gaps. We will use the criteria identified in the Bikeway Recommendations Considerations section to determine preferred improvements and whether on- or off-street facilities are feasible.

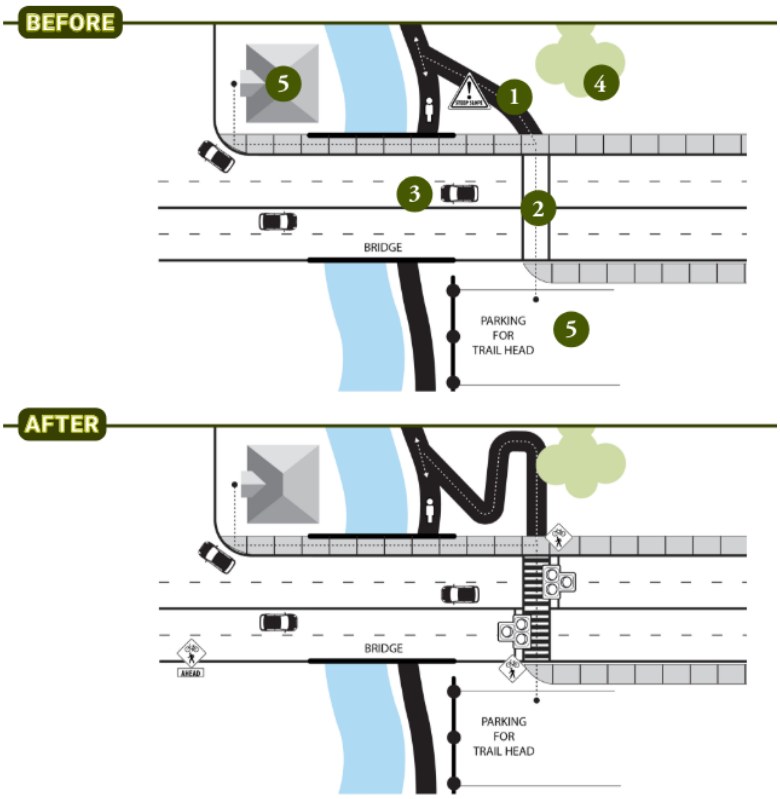
At intersection and midblock multi-use trail crossings, we will determine recommendations primarily based on the roadway characteristics. Figure 2 below is a summary of countermeasures considered for most types of trail crossings, from FHWA's STEP: Improving Visibility at Trail Crossings. There is a lot of crossover with pedestrian recommendations, described in the previous section, though some additional considerations are included, such as specific trail crossing signage.

Figure 2: FHWA STEP Trail Crossing Countermeasures

Countermeasure or Crossing Treatment	Goals		
	Improved Traffic Control	*Speed Reduction*	*Trail User Visibility*
Motorist Stop/Yield signs and markings	x		x
Trail Crossing Warning signs			x
High-visibility crosswalk markings	x		x
Raised crosswalk		x	x
Pedestrian Refuge Island		x	x
RRFB	x		x
Pedestrian countdown signal head	x		
LPI	x		x
Overhead lighting			x
Curb extensions and tighter curb radii		x	x
Increase setback distance between adjacent trail crossing and roadway		x	x
Realign trail approach to roadway		x	x
Parking restrictions			x
Trim vegetation			x

Alta will also consider the context of the roadway and potential improvements based on existing roadway characteristics. Alta will refer to the FHWA STEP (see Figure 3 below) guide to determine the most appropriate countermeasure.

Figure 3: Example trail crossing improvement (FHWA STEP)



Data Needs

Alta proposes using the following data files to support development of recommendations under this task:

Data	Recommended Source
Posted Speed Limit	Open Street Map (OSM)
Average Daily Traffic Volumes	City data (if available), ESRI living Atlas, Replica
Existing/Available Right-of-Way	City data on ROW widths (if available) Parcel Based Analysis (Alta)
Existing Sidewalks, Marked Crosswalks, and Bikeways	City data, Alta Task 2 analysis
Collisions	TIMS (2018-2022), Alta Task 2 analysis
Public Input	Online Interactive Map (Alta), notes/surveys from outreach events (Prosio)